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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,951	10/14/2003	Wenlin Zhang	22.1393DIV	3659

7590 06/02/2005

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EXAMINER
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KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/684,951

Applicant(s)

ZHANG ET AL.

Examiner

Stephen J. Kalafut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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Claims 5-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent for "the produced hydrogen" in this claim or its parent claim 1. Should claim 5 depend on claim 4 instead? Claims 6 and 7 recite the word "type", appended to an otherwise definite term "solid oxide", thus rendering the term indefinite, *ex parte Copenhaver* 109 USPQ 118.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 6 and 7 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by McIntyre *et al.* (US 5,994,901).

McIntyre *et al.* discloses a magnetic resonance logging tool (10), which is operated downhole (column 4, lines 3-7), and includes an internal fuel cell used to supplement its power requirements (column 2, lines 57-59). The fuel cell may be of the solid oxide type (column 10,

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lines 19-22). Thus, a solid oxide fuel cell is used as a power source for, and is operatively connected to a tool within a well.

Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Ruka (US 4,562,124).

Ruka discloses a solid oxide fuel cell. The recitation of intended use, "for use in a well" does not distinguish.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over VanBerg (US 5,202,194).

VanBerg discloses a fuel cell used to provide electricity to a downhole tool (column 2, lines 3-11), which includes a fuel vessel (22), an oxidant vessel (24), a reaction zone (12) and electrical connectors (18, 20), all of which are contained in a housing (38). Operation of this fuel cell and tool would involve connecting the fuel cell to the electrical circuit of the tool, placing them into the hole (*i.e.*, the wellbore), and supplying the tool with electricity from the fuel cell. The fuel cell may be supplied with reactants via two couplings (66, 68) and may discharge water through an outlet (54). However, when these are not in use, the fuel cell is enclosed within the housing except for the electrical connectors. The couplings are necessary when the fuel cell is

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placed permanently downhole (column 6, line 56 through column 7, line 1). This would imply that these components are unnecessary when the fuel cell is instead intended to be removable from the hole. Although at least a part of the water produced by the fuel cell may be pumped from the water storage tank (36) to the outside of the housing (38), it may instead be sent back to the fuel cell (column 6, lines 51-53). Thus, while the fuel cell exemplified in figure 2 includes features through which it would contact the environment other than via the electrical connectors, the fuel cell of VanBerg may instead be enclosed only with the exception of these connectors. At best, it would be obvious to eliminate the additional connections between the fuel cell and its environment when it is placed in the borehole only temporarily.

Claim 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over VanBerg in view of Baker *et al.* (US 4,000,003).

These claims differ from VanBerg by reciting the use of a battery in conjunction with the fuel cell, to provide a hybrid power supply, or the contacting of metal hydride and water to produce hydrogen, which is then fed to the fuel cell. Baker *et al.* disclose a fuel cell which is connected to a battery to provide a hybrid system, which enables the combined power source to sustain peak loads (column 1, lines 28-35). Hydrogen for the fuel cell is produced by reacting the metal hydride  $\text{CaH}_2$  with water, which minimizes the amount of volume needed to store the hydrogen (column 1, lines 36-55). To provide the beneficial ability to accommodate peak loads power demands, and to minimize the volume needed for  $\text{H}_2$  storage, it would be obvious to add to the fuel cell of VanBerg the battery and  $\text{CaH}_2$  hydrogen source of Baker *et al.*

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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fort (US 3,588,804) and Buswell *et al.* (US 3,664,873) disclose fuel cells surrounded by housings, for undersea or downhole operation. Gamo *et al.* (US 5,976,725) disclose a fuel cell which is provided with H<sub>2</sub> from a hydrogen storage alloy.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sjk

  
STEPHEN KALAFUT  
PRIMARY EXAMINER  
GROUP 1700